The paragraph beginning at page 8, line 23, is amended as follows:

The above-described method and assembly provide [device provides], among other things, a low-cost thermal solution by thermally coupling a heat-producing [heat producing] component with a heat sink during a [the] pre-assembly operation.

IN THE CLAIMS

Please substitute the claim set in the appendix entitled "Clean Version of Pending Claims" for the previously pending claim set. The substitute claim set is intended to reflect amendment of previously pending claims 1-30. The specific amendments to individual claims are detailed in the following marked up set of claims.

1. (Once Amended) An electronic assembly [device for dissipating heat from a heat source,] comprising:

a substrate;

a heat sink having at least one mounting pin [disposed on the substrate and soldered to the substrate]; and

at least one heat-producing [heat producing] component attached to the substrate, wherein the heat sink is disposed over the at least one heat-producing component and the substrate, wherein the heat-producing component is sandwiched between the substrate and the heat sink [and], [thermally bonded to the heat sink] wherein a thermal interface material is disposed between the heat sink and the heat-producing component to bond the heat sink to the heat-producing component, and wherein the at least one mounting pin of the heat sink is soldered to the substrate.

2. (Once Amended) The electronic assembly [device] of claim 1, wherein the substrate further comprises:

at least one mounting hole to receive the at least one mounting pin, wherein the at least one mounting pin is disposed in the at least one mounting hole and wave-soldered to attach the heat sink to the substrate and to preheat and bond the heat sink to the heat-producing component

with the disposed thermal interface material [therein, wherein the at least one mounting pin is adapted to be disposed through the at least one mounting hole in the substrate, wherein the heat sink is further attached to the substrate by disposing the pin through the hole and soldering the pin to the substrate during the pre-assembly operation].

3. (Once Amended) The electronic assembly [device] of claim 2 [1], wherein the heat sink further comprises:

a thermally conductive plate, wherein the heat-producing [heat producing] component has front and back sides, the front side being [is] disposed across from the back side, wherein the thermally conductive plate is coupled to the back side and the substrate is attached to the front side, wherein the at least one mounting pin extends beyond the thermally conductive plate and the at least one mounting hole [such that at least one pin can be soldered to the substrate when the thermally conductive plate is coupled to the back side of the heat producing component].

4. (Once Amended) The electronic assembly [device] of claim 3 [2], wherein the heat sink further comprises:

a heat exchange portion, wherein the heat exchange portion extends beyond the thermally conductive plate and is disposed across from the heat-producing [heat producing] component.

5. (Once Amended) The electronic assembly [device] of claim 4 [3], wherein the heat exchange portion comprises:

multiple fins extending away from the thermally conductive plate.

6. (Once Amended) The electronic assembly [device] of claim 3, wherein [further comprising: a] the thermal interface material is disposed between the heat sink and the back side of the heat-producing [heat producing] component [to reduce thermal resistance between the back side of the heat producing component and the heat sink].

7. (Once Amended) The electronic assembly [device] of claim 6, wherein the thermal interface material is selected from the group consisting of a phase change thermal interface material and a thermal grease.

8. (Once Amended) The electronic assembly [device] of claim 3, wherein the substrate is electrically and/or mechanically attached to the front side of the heat-producing component [comprises:

electrically and/or mechanically coupling the front side to the substrate].

9. (Once Amended) The electronic assembly [system] of claim 1, wherein the heat sink is made from a material selected from the group consisting of copper[,] and aluminum[, and other such materials suitable for dissipating heat away from the heat source].

10. (Once Amended) The electronic assembly [system] of claim 1, wherein the heat-producing [heat producing] component is an integrated circuit device selected from the group consisting of a chipset, a microprocessor, a digital signal processor, and an application-specific integrated circuit device.

11. (Once Amended) The electronic assembly [system] of claim 1, wherein the substrate is a printed circuit board.

12. (Once Amended) The electronic assembly [system] of claim 2 [1], wherein the at least one mounting pin is disposed in the at least one mounting hole and wave-soldered during a pre-assembly operation [soldering the at least one pin in the at least one hole to enhance heat dissipation from the heat sink, comprises:

wave soldering the at least one pin disposed in the corresponding at least one hole in the substrate to mechanically couple the heat sink to the substrate during the pre-assembly operation to dissipate heat from the heat producing component].

13. (Once Amended) A method [of assembling an electronic device,] comprising:

mounting a heat-producing [heat producing] component to a substrate;

positioning a layer of thermal interface material onto [on to] the heat-producing [heat producing] component [such that the thermal interface material is disposed on the substrate];

aligning a heat sink including [the] at least one mounting pin over the thermal interface material such that the thermal interface material is sandwiched between the heat-producing [heat producing] component and the heat sink, and further the at least one mounting pin is disposed over the substrate for soldering the at least one mounting pin to the substrate;

reducing the viscosity of the thermal interface material by preheating the thermal interface material in a pre-heater of a wave soldering machine [preheater] to cause the thermal interface material to wet the heat-producing component to thermally couple the heat sink to the heat-producing [heat producing] component; and

attaching the heat sink in a fixed position on the heat-producing [heat producing] component and the substrate by soldering the at least one mounting pin onto the substrate [while the thermal interface material is still hot].

14. (Once Amended) The method of 13, wherein [the] reducing the viscosity of the thermal interface material [further] comprises:

loading the substrate including the heat-producing [heat producing] component, thermal interface material, and the heat sink onto [on to] a conveyor of the [a] wave soldering machine; and

preheating the thermal interface material [in] using the preheater [of the wave soldering machine] to cause the thermal interface material to wet the heat-producing component.

15. (Once Amended) The method of claim 14, further comprising:

cooling the [soldered] at least one mounting pin to mechanically fix the heat sink in place [and to further lock in the thermal coupling established between the heat producing component and the heat sink during the pre-heating].

16. (Once Amended) The method of claim 13[,] wherein, in mounting, the substrate comprises:

at least one hole [therein] to receive the at least one mounting pin of the heat sink [, wherein the at least one pin is disposed through the corresponding hole in the substrate for wave soldering the pin to the substrate].

17. (Once Amended) The method of claim 16, wherein soldering the at least one mounting pin [pins] onto the substrate comprises:

disposing the at least one mounting pin of the heat sink through a corresponding at least one hole in the substrate; and

wave soldering the at least one mounting pin to the substrate [to mechanically attach the heat sink to the substrate, and to further lock in the thermal coupling established between the heat producing component and the heat sink while the thermal interface material is still hot].

18. (Once Amended) The method of claim 13 [16], further comprising:

forming the heat sink including a thermally conductive plate such that the at least one mounting pin extends beyond the thermally conductive plate.

19. (Once Amended) The method of claim 18, wherein forming the heat sink further comprises:

forming a heat exchange portion such that the heat exchange portion extends beyond the thermally conductive plate and across from the heat-producing [heat producing] component.

20. (Once Amended) The method of claim 19, wherein forming the heat exchange portion comprises:

forming multiple fins extending away from the thermally conductive plate.

21. (Once Amended) The method of claim 13[,] wherein, in aligning, the heat sink is made from a material selected from the group consisting of copper[,] and aluminum[, and other such

materials suitable for dissipating heat away from the heat source].

22. (Once Amended) The method of claim 13[,] wherein, in positioning, the thermal interface material capable of melting at a wave soldering [pre-heat temperatures] preheat temperature is selected from the group consisting of a phase change thermal interface material and a thermal grease.

23. (Once Amended) The method of claim 13 [22], wherein mounting the heat-producing [heat producing] component to the substrate[,] comprises:

electrically and/or mechanically coupling the heat-producing [heat producing] component to the substrate.

24. (Once Amended) The method of claim 13[,] wherein, in mounting, the heat-producing [heat producing] component is an integrated circuit device selected from the group consisting of a chipset, a microprocessor, a digital signal processor, and an application-specific integrated circuit device.

25. (Once Amended) A method [of assembling an electronic device,] comprising:

mounting a heat-producing [heat producing] component onto [to] a substrate having at least one mounting hole therein;

aligning a heat sink having at least one mounting pin to the substrate, with [each of] the at least one mounting pin [mount pins] inserted into the at least one [a] mounting hole;

positioning a thermal interface material between the heat-producing [heat producing] component and the heat sink; and

[reducing the viscosity of the thermal interface material and securing the heat sink in a fixed position on the substrate by] using [exposing the device to] a wave soldering process to cause the thermal interface material to wet and [thermally] bond the heat sink and the heat-producing [heat producing] component and to [further] solder the at least one mounting pin to the at least one mounting hole.

26. (Once Amended) The method of claim 25, further comprising:

forming the heat sink to have [including] a thermally conductive plate, [such that] wherein the at least one mounting pin extends beyond the thermally conductive plate.

27. (Once Amended) The method of claim 26, wherein forming the heat sink further comprises:

forming a heat exchange portion [such] that [the heat exchange portion] extends beyond the thermally conductive plate and is disposed across from the heat-producing [heat producing] component.

28. (Once Amended) The method of claim 27[,] wherein, in aligning, the heat sink is made from materials [a material] selected from the group consisting of copper[,] and aluminum[, and other such materials suitable for dissipating heat away from the heat source].

29. (Once Amended) The method of claim 25[,] wherein, in positioning, the thermal interface material capable of melting at a wave soldering [pre-heat temperatures] preheat temperature is selected from the group consisting of a phase change thermal interface material and a thermal grease.

30. (Once Amended) The method of claim 25[,] wherein, in mounting, the heat-producing [heat producing] component is an integrated circuit device selected from the group consisting of a chipset, a microprocessor, a digital signal processor, and an application-specific integrated circuit device.

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on June 17, 2002, and the references cited therewith. Claims 1-30 have been amended and are pending in this application.